

Date : October 26, 2016

SAMPLE IDENTIFICATION

Internal code : 16J20-TOB26-1-DM

Customer identification : Peppermint - India

Type : Essential oil

Source : *Mentha x piperita*

Customer : TruIQ Gblal, LLC

ANALYSIS

Method : PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

Analyst : Sylvain Mercier, M. Sc., chimiste

Analysis date : 2016-10-26

Checked and approved by :

Sylvain Mercier, M. Sc., chimiste 2014-005

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Hexanol	2.73	883	0.01	0.01	1314	4.52	Aliphatic alcohol
2,5-Diethyltetrahydrofuran	2.85	892	0.02	0.01	983	1.01	Furan
α -Thujene	3.25	918	0.03	0.02	963	0.93	Monoterpene
α -Pinene	3.35	924	0.67	0.63	940	0.84	Monoterpene
Camphene	3.64	942	0.04	0.04	990	1.04	Monoterpene
3-Methylcyclohexanone	3.95	961	0.06	0.04	1237	3.45	Aliphatic ketone
Sabinene	4.07	968	0.28	0.27	1050	1.45	Monoterpene
β -Pinene	4.13	971	1.06	1.02	1034	1.32	Monoterpene
Myrcene	4.41	988	0.23	0.21	1110	1.93	Monoterpene
Octan-3-one	4.46	991	0.02	0.27	1200	2.97*	Aliphatic ketone
Octen-3-ol	4.51	994	0.03	0.05	1421	6.07	Aliphatic alcohol
α -Phellandrene	4.68*	1004	0.04	0.02	1103	1.87	Monoterpene
Δ^3 -Carene	4.68*	1004	[0.04]	0.02	1082	1.70	Monoterpene
Octan-3-ol	4.77	1009	0.16	0.15	1341	4.91	Aliphatic alcohol
α -Terpinene	4.87	1015	0.06	0.07	1117	2.00	Monoterpene
para-Cymene	5.08	1026	0.22	[0.27]	1200	2.97*	Monoterpene
Limonene	5.10*	1028	2.20	1.67	1135	2.22	Monoterpene
β -Phellandrene	5.10*	1028	[2.20]	5.22	1140	2.27*	Monoterpene
1,8-Cineole	5.17	1031	4.64	[5.22]	1140	2.27*	Monoterp. ether
<i>cis</i> - β -Ocimene	5.28	1037	0.06	0.16	1181	2.75*	Monoterpene
<i>trans</i> - β -Ocimene	5.46	1047	0.02	0.01	1191	2.87	Monoterpene
γ -Terpinene	5.64	1057	0.12	[0.16]	1181	2.75*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.00	1076	0.15	1.88	1403	5.80*	Monoterp. alcohol
Terpinolene	6.12	1083	0.05	0.05	1218	3.19	Monoterpene
Linalool	6.64	1107	0.13	0.17	1489	7.35	Monoterp. alcohol
Camphor	7.72	1147	0.02	0.04	1439	6.42	Monoterp. ketone
Isopulegol	7.76	1148	0.09	4.73	1494	7.45*	Monoterp. alcohol
Menthone	8.01	1158	22.45	23.14	1390	5.61	Monoterp. ketone
Unknown (m/z=97, 83 (47), 41 (37), 55 (33), 111 (30), 69 (30), 112 (25), 154 (19))	8.05	1159	0.40	0.23	1405	5.83	Monoterp. ketone
Menthofuran	8.09	1161	1.82	[1.88]	1403	5.80*	Monoterp. ether
iso-Isopulegol	8.12	1162	0.22	0.17	1485	7.27	Monoterp. alcohol
Isomenthone	8.20	1165	3.24	3.89	1409	5.89	Monoterp. ketone
Lavandulol	8.33	1170	0.15	0.20	1623	10.98*	Monoterp. alcohol
neo-Menthol	8.49	1176	4.27	5.11	1528	8.17*	Monoterp. alcohol
Borneol	8.54	1178	0.13	0.16	1628	11.19	Monoterp. alcohol
<i>trans</i> -Isopulegone	8.59	1180	0.12	0.24	1504	7.63*	Monoterp. ketone
Terpinen-4-ol	8.70	1184	0.45	[5.11]	1528	8.17*	Monoterp. alcohol
Menthol	9.02	1196	43.20	42.94	1574	9.51	Monoterp. alcohol
Isomenthol	9.11	1198	0.45	0.42	1550	8.80	Monoterp. alcohol

neiso-Menthol	9.29	1202	0.30	1.03	1620	10.88*	Monoterp. alcohol
α-Terpeneol	9.42	1205	0.35	[1.03]	1620	10.88*	Monoterp. alcohol
β-Phellandren-8-ol	9.66	1210	0.02	0.03	1700	14.35	Monoterp. alcohol
Pulegone	10.84	1237	1.21	1.20	1545	8.64	Monoterp. ketone
Carvone	11.24	1246	0.12	[1.03]	1620	10.88*	Monoterp. ketone
Piperitone	11.63	1255	0.64	[1.03]	1620	10.88*	Monoterp. ketone
neo-Menthyl acetate	12.21	1267	0.15	0.20	1459	6.78	Monoterp. ester
Bornyl acetate	12.97	1284	0.11	1.62	1525	8.06*	Monoterp. ester
Menthyl acetate	13.21	1289	4.84	[4.73]	1494	7.45*	Monoterp. ester
Isomenthyl acetate	13.82	1300	0.08	[0.24]	1504	7.63*	Monoterp. ester
Bicycloelemene	14.78	1315	0.03	0.04	1434	6.31	Sesquiterpene
Menthofuro lactone	16.79	1346	0.03				Monoterp. lactone
α-Copaene	17.40	1355	0.04	0.06	1430	6.23	Sesquiterpene
β-Bourbonene	17.82	1362	0.15	0.17	1453	6.67	Sesquiterpene
β-Elementene	18.63	1374	0.08	[5.11]	1528	8.17*	Sesquiterpene
β-Caryophyllene	20.29	1399	2.13	[1.62]	1525	8.06*	Sesquiterpene
α-Humulene	23.02	1432	0.07	0.05	1599	10.28	Sesquiterpene
trans-β-Farnesene	24.17	1446	0.08	[0.20]	1623	10.98*	Sesquiterpene
γ-Murolene	25.21*	1458	0.33	0.05	1611	10.60	Sesquiterpene
Germacrene D	25.21*	1458	[0.33]	[1.03]	1620	10.88*	Sesquiterpene
Bicyclgermacrene	26.47	1473	0.05	0.06	1639	11.61	Sesquiterpene
α-Selinene	26.54	1473	0.11	0.08	1644	11.87	Sesquiterpene
γ-Cadinene	28.26	1494	0.03	0.03	1666	12.80	Sesquiterpene
Mint lactone	28.42	1496	0.05	0.05	2126	37.77	Monoterp. lactone
δ-Cadinene	28.92	1503	0.08	0.05	1673	13.14	Sesquiterpene
Caryophyllene oxide	33.50	1566	0.19	0.13	1847	22.52	Sesquiterp. ether
Viridiflorol	34.58	1581	0.05	0.05	1978	31.15	Sesquiterp. alcohol
Total identified			98.23%	97.91%			

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

Note: no correction factor was applied

OTHER DATA

Physical aspect : Faintly yellow liquid

Refractive index : 1.4600 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent were detected using this method.



